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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/587,076	06/02/2000	Bernard Traversat	5181-46700 P4453	7303

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Robert C Kowert
Conley Rose & Tayon PC
P O Box 398
Austin, TX 78767-0398

EXAMINER

CHEN, CHONGSHAN

ART UNIT	PAPER NUMBER
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2172

DATE MAILED: 01/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/587,076

Applicant(s)

TRAVERSAT ET AL.

Examiner

Chongshan Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-56 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other:

DETAILED ACTION

1. Claims 1-56 are pending in this Office Action.

Information Disclosure Statement

2. The 10 pages information disclosure statement (IDS) filed on August 6, 2001 and August 16, 2001, Paper No. 5 and 6, includes at least 119 U. S. Patents, 85 non-patent documents. None of the documents has been provided in the current file. This IDS is unusually large.

The IDS and the information referred to therein has been placed in the file but not considered.

Significantly, an applicant's duty of disclosure of material and information is not satisfied by presenting a patent examiner with "a mountain of largely irrelevant [material] from which he is *presumed* to have been able, with his expertise and with adequate time, to have found the critical [material]. It ignores the real world conditions under which examiners work." *Rohm & Haas Co. v. Crystal Chemical Co.*, 722 F.2d 1556, 1573 [220 USPQ 289] (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

The applicants are requested to identify the relevant references including relevant sections highlighted in each of the relevant references, since they are believed to be the most knowledgeable about the content of the information included in the IDS submitted.

3. The IDS filed on September 17, 2001, Paper No. 7 are same as the IDS filed on August 16, 2001, Paper No. 6.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-12, 15-27, 30-40, 43-53 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (6,345,276) in view of Tucker (6,178,519).

As per claim 1, Lee teaches a method for managing a virtual heap for a process executing within a virtual machine executing within a device, the method comprising:

providing a store heap for the process, wherein the store heap is comprised in the virtual heap (Lee, col. 1, lines 40-50);

providing an in-memory heap for the process, wherein the in-memory heap comprises a cached portion of the store heap for the process, and wherein the in-memory heap is comprised in the virtual heap (Lee, col. 1, lines 28-50);

performing an atomic transaction on the virtual heap, wherein said performing the atomic transaction comprises performing one or more transaction tasks, and wherein said performing the atomic transaction changes a state of the virtual heap by modifying one or more portions of the virtual heap (Lee, col. 5, lines 40-67);

committing the atomic transaction by accepting the modifications to the one or more portions of the virtual heap if the one or more transaction tasks in the atomic transaction are performed without generating an error (Lee, col. 5, lines 40-67).

Lee does not explicitly disclose rejecting the atomic transaction by restoring the virtual heap to the state of the virtual heap prior to said performing the atomic transaction if one or more of the one or more transaction tasks in the atomic transaction generates an error when performed. Tucker teaches rejecting the atomic transaction by restoring the virtual heap to the state of the virtual heap prior to said performing the atomic transaction if one or more of the one or more transaction tasks in the atomic transaction generates an error when performed (Tucker, Fig. 1, Rollback, col. 5, lines 8-30). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a rollback feature in the method of Lee in order to return the system back to the previous state when a transaction fails.

As per claim 2, Lee and Tucker teach all the claimed subject matters as discussed in claim 1, and further teach wherein an access state of the store heap is closed prior to said performing the atomic transaction, and wherein the closed access state prohibits performing the atomic transaction (Tucker, col. 3, lines 16-61, locking); the method further comprising: changing the access state of the store heap to open prior to said performing the atomic transaction, wherein the open access state permits said performing the atomic transaction (Tucker, col. 3, lines 16-61, locking).

As per claim 3, Lee and Tucker teach all the claimed subject matters as discussed in claim 2, and further teach changing the access state of the store heap to closed subsequent to said performing the atomic transaction (Tucker, col. 3, lines 16-61).

As per claim 4, Lee and Tucker teach all the claimed subject matters as discussed in claim 1, and further teach wherein the atomic transaction is an atomic write transaction (Tucker, col. 3, lines 16-61); and wherein said performing the atomic transaction comprises: reading a

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first portion of the in-memory heap (Tucker, col. 3, lines 16-61); and writing the first portion of the in-memory heap to the store heap (Tucker, col. 3, lines 16-61).

As per claim 5, Lee and Tucker teach all the claimed subject matters as discussed in claim 4, and further teach verifying that the first portion of the in-memory heap is successfully read from the in-memory heap prior to said writing the first portion of the in-memory heap to the store heap (Tucker, col. 3, lines 16-61).

As per claim 6, Lee and Tucker teach all the claimed subject matters as discussed in claim 4, and further teach deleting the first portion from the in-memory heap subsequent to said reading the first portion from the in-memory heap (Tucker, col. 7, lines 6-20).

As per claim 7, Lee and Tucker teach all the claimed subject matters as discussed in claim 1, and further teach wherein the atomic transaction is an atomic read transaction (Tucker, col. 7, lines 6-20); and wherein said performing the atomic transaction comprises: reading a second portion of the store heap (Tucker, col. 7, lines 6 – col. 8, line 19); and writing the second portion of the store heap to the in-memory heap (Tucker, col. 7, lines 6 – col. 8, line 19).

As per claim 8, Lee and Tucker teach all the claimed subject matters as discussed in claim 7, and further teach verifying that the second portion of the store heap is successfully read from the store heap prior to said writing the first portion of the store heap to the in-memory heap (Tucker, col. 7, lines 6 – col. 8, line 19).

As per claim 9, Lee and Tucker teach all the claimed subject matters as discussed in claim 1, and further teach wherein the atomic transaction is an atomic delete transaction (Tucker, col. 7, lines 6 – col. 8, line 19); and wherein said performing the atomic transaction comprises: deleting a third portion of the store heap (Tucker, col. 7, lines 6 – col. 8, line 19).

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As per claim 10, Lee and Tucker teach all the claimed subject matters as discussed in claim 1, and further teach checkpointing the store heap to a persistent store to make the virtual heap persistent (Tucker, col. 3, lines 17-54).

As per claim 11, Lee and Tucker teach all the claimed subject matters as discussed in claim 1, and further teach wherein the store heap is one of a plurality of store heaps in a persistent store (Tucker, col. 3, lines 17-61); wherein each of the plurality of store heaps is associated with one of a plurality of processes; and wherein the process is one of the plurality of processes (Tucker, col. 2, lines 60-65).

As per claim 12, Lee and Tucker teach all the claimed subject matters as discussed in claim 1, and further teach wherein the store heap and the in-memory heap are comprised in one memory address space (Tucker, col. 2, lines 3-14).

As per claim 15, Lee and Tucker teach all the claimed subject matters as discussed in claim 1, and further teach wherein the in-memory heap and the store heap comprise objects for the process, and wherein the objects comprise code and data for use by the process during execution within the virtual machine (Tucker, col. 2, lines 3-45).

As per claim 16, Lee teaches a method for managing a virtual heap on a virtual machine executing within a device, the method comprising:

providing a store heap for a first process executing within the virtual machine, wherein the store heap is comprised in the virtual heap (Lee, col. 1, lines 40-50);

providing an in-memory heap for the first process, wherein the in-memory heap comprises a cached portion of the store heap for the first process, and wherein the in memory heap is comprised in the virtual heap (Lee, col. 1, lines 40-50, col. 5, lines 40-67);

providing an application programming interface (API) for performing heap operations on the virtual heap, wherein the API comprises functions for performing operations on portions of the virtual heap, and wherein the functions in the API are callable by processes executing within the virtual machine (Lee, col. 4, lines 29-32);

a second process calling a first function from the API to perform a first operation on a first portion of the virtual heap (Lee, col. 5, lines 40-67);

performing the first operation on the first portion of the virtual heap in response to the second process calling the first function, wherein said performing the first operation changes a state of the virtual heap by modifying the first portion of the virtual heap (Lee, col. 5, lines 40-67);

committing the first operation on the first portion of the virtual heap by accepting the modifications to the first portion of the virtual heap if the first operation is performed without generating an error (Lee, col. 5, lines 40-67).

Lee does not explicitly disclose rejecting the first operation on the first portion of the virtual heap by restoring the virtual heap to the state of the virtual heap prior to said performing the first operation if the first operation generates an error when performed. Tucker teaches rejecting the first operation on the first portion of the virtual heap by restoring the virtual heap to the state of the virtual heap prior to said performing the first operation if the first operation generates an error when performed (Tucker, Fig. 1, Rollback, col. 5, lines 8-30). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a rollback feature in the method of Lee in order to return the system back to the previous state when a transaction fails.

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As per claim 17, Lee and Tucker teach all the claimed subject matters as discussed in claim 16, and further teach the first process and the second process are the same process (Lee, col. 5, lines 40-67).

As per claim 18, Lee and Tucker teach all the claimed subject matters as discussed in claim 16, and further teach the second process is a heap management process (Lee, col. 5, lines 40-67).

Claims 19-27 are rejected on grounds corresponding to the reasons given above for claims 4-12.

Claim 30 is rejected on grounds corresponding to the reasons given above for claim 15.

As per claim 31, Lee teaches a system comprising:

a device configured to execute a virtual machine, wherein the virtual machine is configured to execute a process (Lee, col. 5, lines 40-67);

a first memory coupled to the device, wherein the first memory is configured to store a store heap for the process, wherein the store heap is comprised within a virtual heap for the process (Lee, col. 5, lines 40-67);

a second memory coupled to the device, wherein the second memory is configured to store an in-memory heap for the process, wherein the in-memory heap is comprised within the virtual heap, wherein the in-memory heap comprises cached portions of the store heap for access by the process (Lee, col. 5, lines 40-67);

wherein the device is configured to perform operations on the virtual heap according to an application programming interface (API), and wherein the API comprises functions for

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performing the operations on the virtual heap, and wherein the functions in the API are callable by the process, and wherein the API is configured to (Lee, col. 4, lines 29-32):

perform an atomic transaction on the virtual heap, wherein the atomic transaction comprises one or more transaction tasks, and wherein the atomic transaction changes a state of the virtual heap by modifying one or more portions of the virtual heap (Lee, col. 5, lines 40-67);

commit the atomic transaction by accepting the modifications to the one or more portions of the virtual heap if the one or more transaction tasks in the atomic transaction are performed without generating an error (Lee, col. 5, lines 40-67).

Lee does not explicitly disclose rejecting the atomic transaction by restoring the virtual heap to the state of the virtual heap prior to the atomic transaction if one or more of the one or more transaction tasks in the atomic transaction generates an error when performed. Tucker teaches rejecting the atomic transaction by restoring the virtual heap to the state of the virtual heap prior to the atomic transaction if one or more of the one or more transaction tasks in the atomic transaction generates an error when performed (Tucker, Fig. 1, Rollback, col. 5, lines 8-30). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a rollback feature in the method of Lee in order to return the system back to the previous state when a transaction fails.

Claims 32-40 are rejected on grounds corresponding to the reasons given above for claims 2-12.

Claim 43 is rejected on grounds corresponding to the reasons given above for claim 15.

Claims 44-53 are rejected on grounds corresponding to the reasons given above for claims 1-12.

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Claim 56 is rejected on grounds corresponding to the reasons given above for claim 15.

6. Claims 13-14, 28-29, 41-42 and 54-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (6,345,276) in view of Tucker (6,178,519) and further in view of Lawrence (6,629,113).

As per claim 13, Lee and Tucker teach all the claimed subject matters as discussed in claim 1, except for explicitly disclosing wherein the device is a mobile computing device. Lawrence teaches the device is a mobile computing device (Lawrence, col. 4, lines 60-63). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a mobile computing device in order to process anywhere.

As per claim 14, Lee and Tucker teach all the claimed subject matters as discussed in claim 1, except for explicitly disclosing wherein the virtual machine is a Java virtual machine; and wherein the process is a Java application. Lawrence teaches the virtual machine is a Java virtual machine; and wherein the process is a Java application (Lawrence, col. 1, lines 15-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Java platform because Java is portable and Java program can be run on different systems.

Claims 28-29, 41-42 and 54-55 are rejected on grounds corresponding to the reasons given above for claims 13-14.

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Conclusion

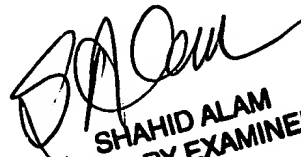
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chongshan Chen whose telephone number is 703-305-8319.

The examiner can normally be reached on Monday - Friday (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Breene can be reached on (703)305-9790. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

January 8, 2004


SHAHID ALAM
PRIMARY EXAMINER